

CLAIMS:

1. A process for the manufacture of a SAPO-34 crystalline molecular sieve,
the process comprising the steps of: (a) forming a surfactant-free synthesis
mixture containing sources of silicon, of aluminium, and of phosphorus, in
proportions appropriate to the formation of SAPO-34, and a structure-
directing agent, where the source of silicon is a tetraalkyl orthosilicate, and
(b) subjecting the synthesis mixture to hydrothermal treatment.
2. The process of claim 1 wherein the molar ratio of silicon to aluminium,
expressed as $\text{SiO}_2 : \text{Al}_2\text{O}_3$, is at most 0.5:1.
3. The process of claim 1 wherein the tetraalkyl orthosilicate is a tetraethyl
orthosilicate.
4. The process of claim 1 wherein the tetraalkyl orthosilicate is selected from
the group consisting of a tetramethyl orthosilicate, a tetrapropyl
orthosilicate, and a tetrabutyl orthosilicate.
5. The process of claim 1 wherein the structure-directing agent is TEAOH or
a mixture of TEAOH and DPA.
6. The process of claim 1 wherein at least a part of the hydrothermal
treatment step is carried out with agitation.
7. The process of claim 1, wherein the synthesis mixture has a molar
composition within the ranges of

P_2O_5	:	Al_2O_3	0.6 to 1.2:1
SiO_2	:	Al_2O_3	0.01 to 0.5:1
H_2O	:	Al_2O_3	10 to 100:1

5 together with the structure-directing agent.

8. The process of claim 1 wherein the synthesis mixture is surfactant-free.

10 9. The process of claim 1 wherein the SAPO-34 crystalline molecular sieve has a mean particle size of at most 400 nm.

10. The process of claim 1 wherein the SAPO-34 crystalline molecular sieve is subjected to the step(s) of one or more of the group consisting of washing, cation exchange, and calcining.

15

11. A process for hydrocarbon conversion, adsorption or separation, in the presence of the SAPO-34 crystalline molecular sieve of claim 1.

20 12. A process for the conversion of an oxygenate to olefins in the presence of the SAPO-34 crystalline molecular sieve of claim 1.

25 13. A process for the conversion of an oxygenate to olefins in a reactor, the process comprising the steps of (a) contacting the oxygenate under catalytic conversion conditions with a SAPO-34 molecular sieve having a mean particle size of at most 400 nm; and (b) withdrawing olefins from the reactor.

30 14. A SAPO-34 crystalline molecular sieve having a mean particle size of at most 400 nm.

15. The SAPO-34 crystalline molecular sieve of claim 13 wherein the mean particle size is at most 200 nm.

16. The SAPO-34 crystalline molecular sieve of claim 13 wherein the mean particle size is at most 50 nm.